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AIR TRAFFIC ORGANIZATION

Future Communications Study (FCS)

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Agenda

- Study Objective
- Background motivation for Future Communications Study (FCS)
- Study Organizational Structure and Scope
- Technology Assessment and Prescreening
- Schedule

FCS Objective

Objective:

This Study is a coordinated effort between the FAA/NASA and Eurocontrol to progress the identification of a Future Globally Interoperable Communications System to support Air Traffic Management Operations in the time frame of 2020 and beyond.

FCS Background

- Aeronautical air-to-ground voice and data communications capacity for Air Traffic Management (ATM) is reaching saturation
  - Most severe in Europe and parts of the United States
    - 8.33 kHz channel spacing in Europe
    - 25 kHz channel spacing in the US
- Various proposals to address this problem have been offered and approved independently; none has achieved global endorsement
- ICAO is seeking a common, global solution through the Aeronautical Communications Panel (ACP)
- The FAA and Eurocontrol have started a bi-lateral study of the problem with the support of NASA; study to provide major input to ICAO ACP

FCS Background (cont'd)

- AMCP/5 (April 1995)
  - Recommendation 4/2 Future Operational and System Concept Exploration: Explore the likely airspace user needs and the long term system requirements for aeronautical VHF systems in light of ATM operational concept for beyond 2010.
- AMCP/7 (March 2000)
  - (Task CNS-9102) Carry out the fact-finding and conduct the necessary studies for the development of datalinks for air traffic services and aeronautical operational Control
- AMCP WG-C1(Oct 2000)
  - Action WGC/1-9: WG-C to develop a report with the objective to recommend a scenario in which a common global interoperable communication infrastructure could be ensured for the future.
- ANC/11 (Oct 2003)
  - Recommendation 7/3: In view of anticipated saturation of the VHF band for voice communication, consider transition to spectrally more efficient ICAO systems, and/or make increased use of data communications and investigate multi-mode avionics as a transitional method of achieving interoperability of air/ground communications, where global harmonization has not been achieved.
  - Recommendation 7/4: Investigate new terrestrial and satellite-based technologies, on the basis of their potential for ICAO standardization for aeronautical mobile communications use, taking into account the safety-critical standards of aviation and the associated cost issues.
- FAA/Eurocontrol Meeting (Oct 2003)
  - Agreement to undertake a study to investigate future communications needs and technologies.

US FAA FCS Organization

Future Communications Study Steering Group
(Chair- James Eck/FAA)

Study Direction
Management Coordination

Study Team Lead
(Brent Phillips/FAA)

Resource Planning
Team Tasking & coordination
International Coordination

Technology Assessment
NASA Glenn Research Center
(Jim Budinger/NASA)

Candidate Technologies
Technology Feasibility/Maturity
System Modeling/Simulation
Prototype/Test

ITT/AES Support

Operational Environment Description & Transition Analysis
(Rhonda Thomas/FAA)

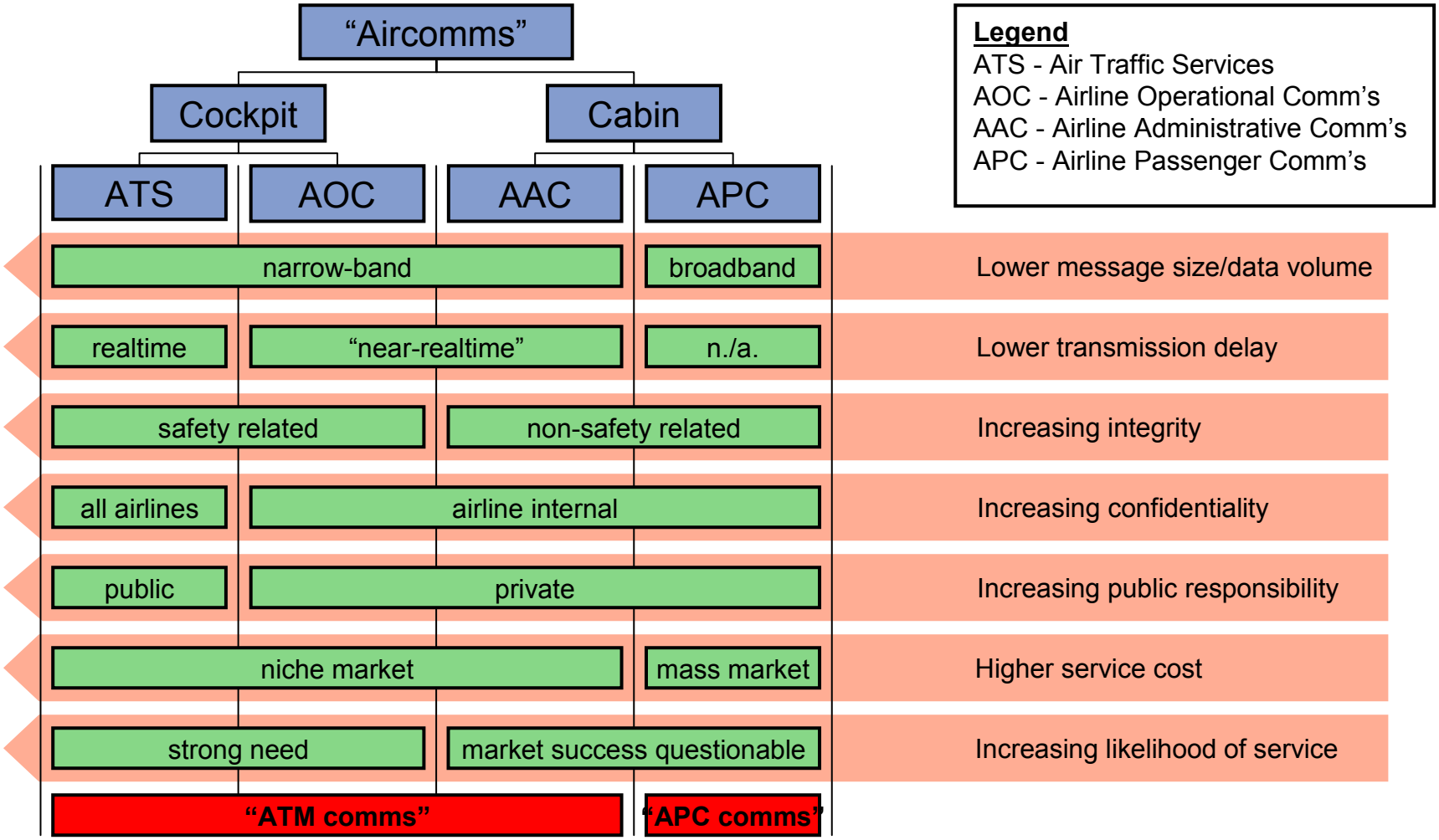
System Architecture
Safety/Certification
Security
Spectrum
Airborne Co-site
Ground System Integration
Cost/Benefits Considerations

Operational Concepts & Requirements

(G. Anderson/FAA)
(R Jehlen/FAA)

Data/Voice Ops Concepts
Functional Analysis
Voice Usage Projection
Data Throughput analysis
Human Factors

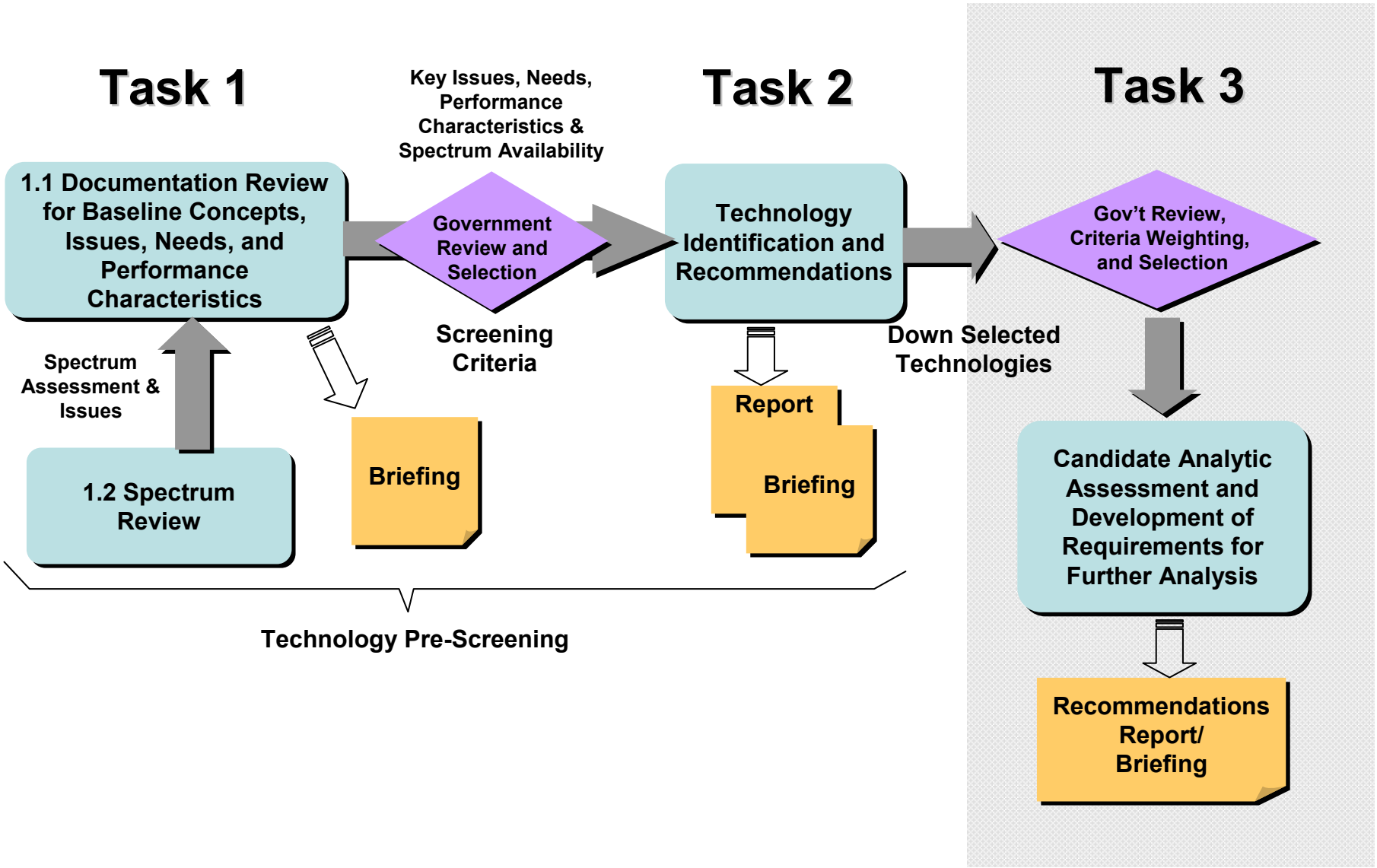
The Scope of FCS is ATS Communications*



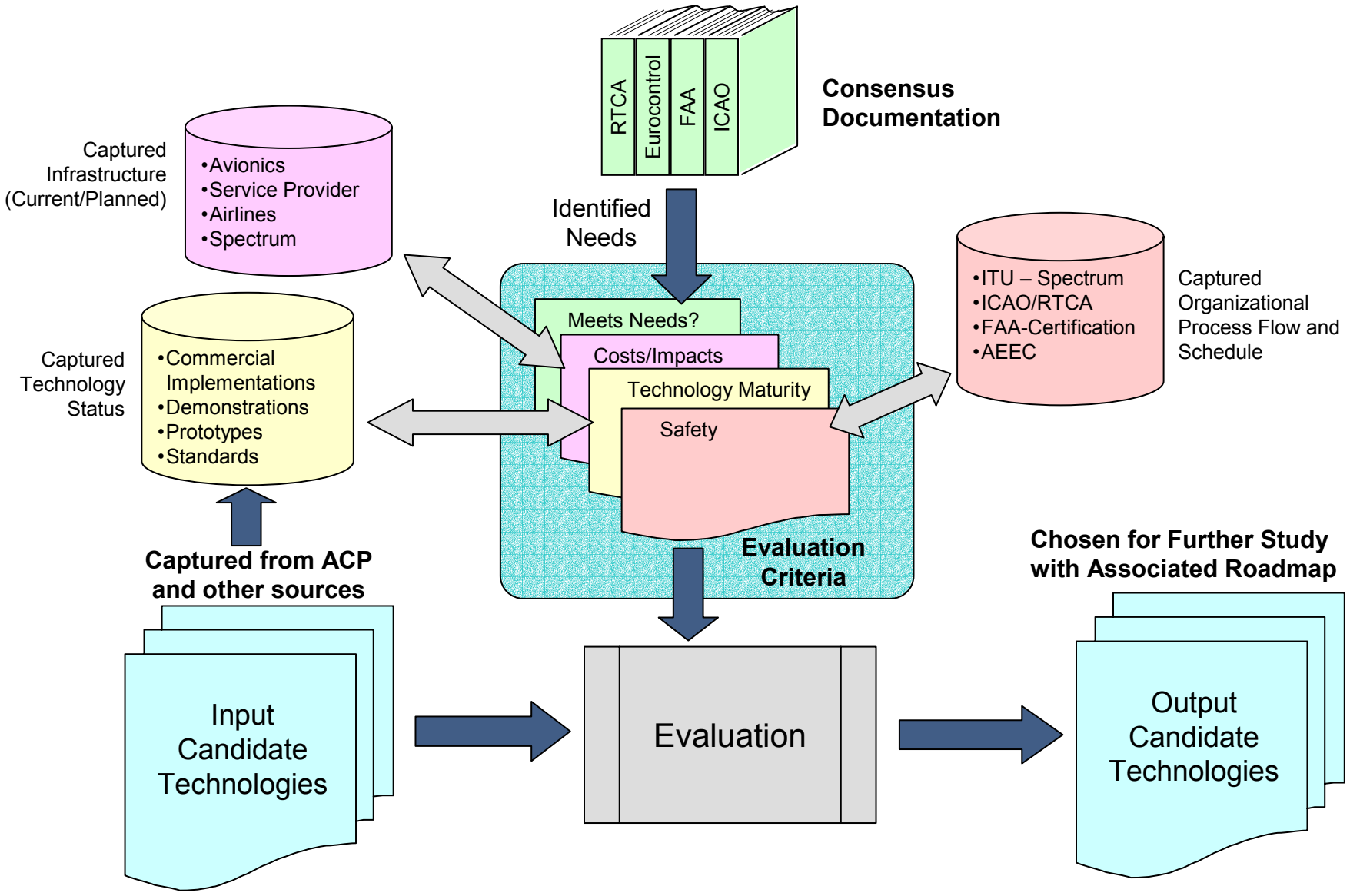
*However, the ability of the system to support AOC etc. is a positive collateral benefit in that it addresses the needs of an important stakeholder and supports advanced information sharing (SWIM)

Figure from: The future role of satcom in civil aviation – ATN2002 - Astrium

Technology Assessment Tasks



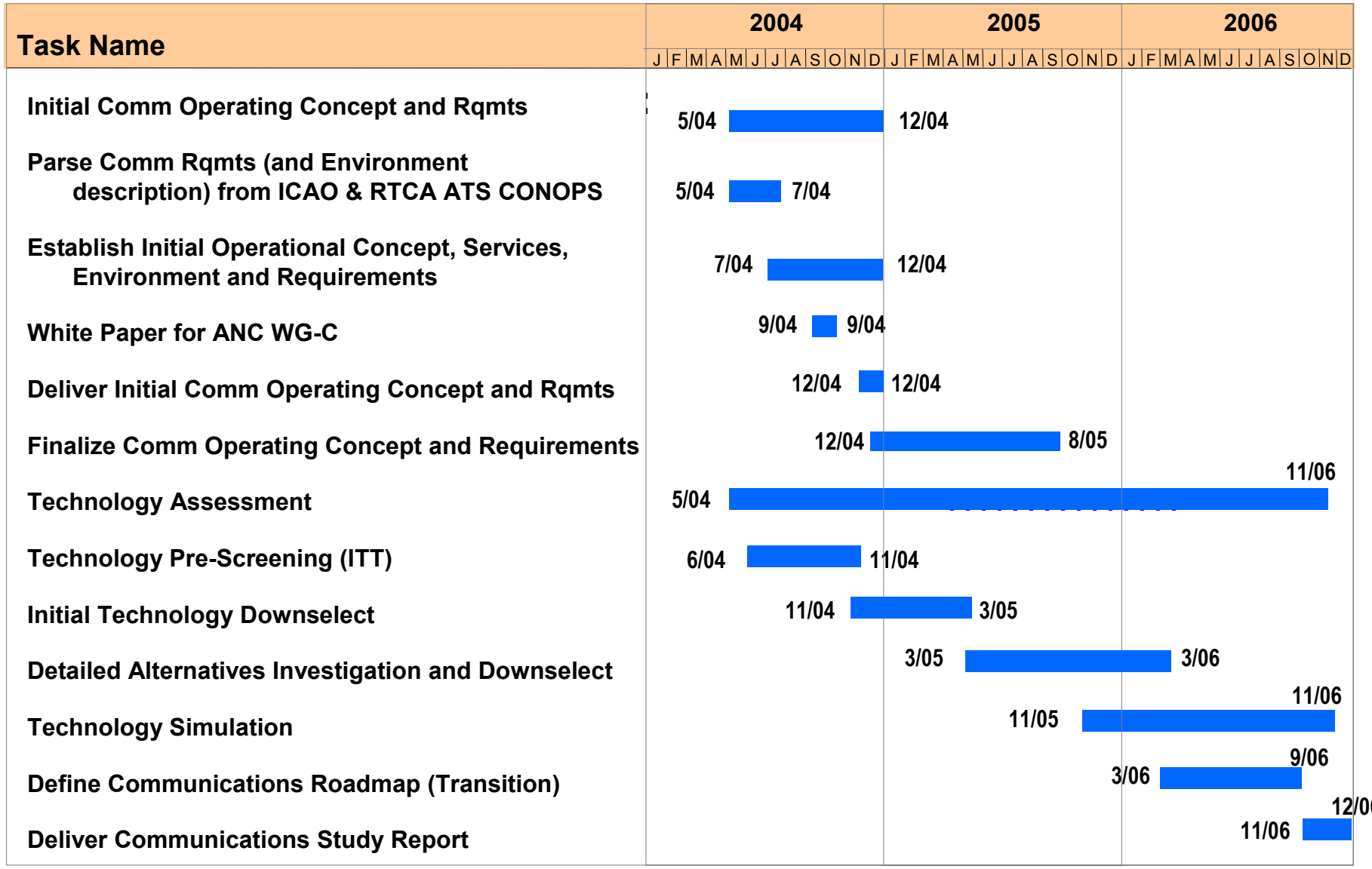
Elements of the Candidate Technology Pre-Screening



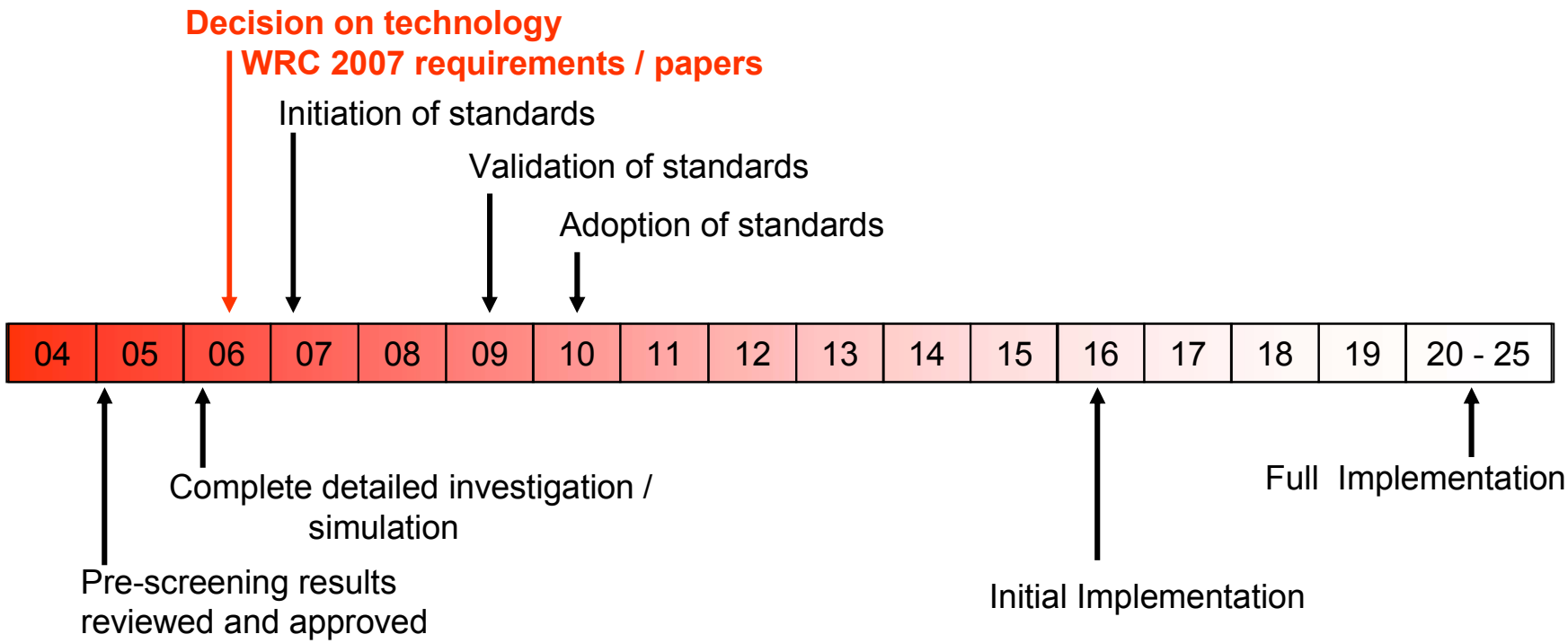
Prospective Solution Set

From ICAO	From Review of Comm. Services	From RFI
B-VHF	VDL Mode 2	Packet Radio
ADL	VDL Mode 3	VoIP Using OFDM in MLS Band
SDLS	VDL Mode 4	Flash OFDM
Connexion By Boeing	DECT	Safety and Security Enhanced Voice
Aero B-GAN & Inmarsat Family	TD-SCDMA	VDL Mode 3 + SAIC
3GPP UMTS (FDD)	JTIDS	Iridium Netted Radios
CDMA2000 1xRTT	APCO P-25	VDL Mode E
	TETRA	
	TETRAPOL	
	IRIDIUM	
	802.11	
	SCADA	

Study Schedule



Timeline Towards GACS 2020



Global A/G Communications System (GACS Timeline)

** * Adopted from ACP WGC7/WP23, Kors van den Boogaaard (IATA)*